

colorcue

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BASIC FILES

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COLORCUE!

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colorcues

contributing
to the
success
of this issue

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editor's letter

The winning display in our graphics contest is something to see -- and you'll be able to see it soon at your dealer's or at one of the many computer shows we attend. See "Graphics Contest Entries Dazzle The Eye" for the clever designer's name. We have an article on transferring BASIC files and, since we've added so many new user groups in the past couple of months, we've included an updated User Group Directory.

This is my last issue as editor of **COLORCUE**. I'd like to take this opportunity to repeat once again how much I have appreciated your calls, letters and articles over the past year. I've never had more fun nor worked with a finer user group!

Please address all **COLORCUE** mail to:

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Again, many thanks for all your support!



rem

Yes, we do indeed have a winner! But before we announce the name of that intrepid designer, let me just say that the entries we received were sparkling, colorful, dynamic, useful, and even humorous -- as demonstrated by our contest winner, Frank Raab of Sunnyvale, California. **GRAPHICS CONTEST ENTRIES DAZZLE THE EYE!**

Frank's winning entry comes up with a Compucolor keyboard on the screen. Not so special, but wait -- what's this? A hand sneaks up from the bottom of the screen and types, one

letter at a time in perfect "one finger precision" fashion --

COMPUCOLOR

The cuff on the hand's sleeve has bands of pastel colors, and the pause before each letter is typed adds to the viewer's spellbinding anticipation. Hooray! This animated graphic was sent to the National Computer Conference in Anaheim and to the Ham Fest here in Atlanta where it kept crowds of people delighted for days.

Frank's been a Compucolor owner for 15 months. He started with a CC Model 4, which he upgraded to a 32K Model 5 with dual drives. This was his first 8080 assembly language program. Frank admits that, "...it may not be elegant, but it works!" The project took him three weeks to complete. Frank has been programming for 10 years and is currently employed as a Navy pilot where he's been able to keep his programming hand in with DEC's and HP calculators.

Congratulations and \$1,000 in equipment credit goes to Mr. Raab for his stunning work. We hope he enjoyed his foray into the wonderful world of assembly and continues to develop much, much more!

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TRANSFERRING BASIC FILES FROM OTHER COMPUTERS

By Trevor Taylor
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Blacksburg, Va. 24060

The program below is a handy little routine that will allow you to transfer BASIC programs from any other computer through the RS-232C port. The other computer simply sends the file as ASCII text, e.g. by LISTing the program with the output going to the RS-232C port if the other machine is a Compucolor, for example.

I have used this routine to transfer files over the phone from an IBM 370/158 and a Honeywell 68/60. If you are interested in transferring files in this fashion, you will need a modem. In order to transfer files from another hobby computer using the phone, e.g. a TRS-80, it is essential that either you or the other person have a modem which can both answer and originate. (Radio Shack Part Number 26-1171, for example.) This is because one of you must act as the "computer" while the other pretends to be a "terminal".

To transfer files from another hobby computer which you plan to connect directly to the Compucolor, you have to make an interconnecting cable. Remember to switch the wires to pins 2 and 3 on one of the plugs on this cable. (The "computer" versus "terminal" problem again.)

To use the program, dial up (or plug in to) the other computer and establish communications, hit CPU RESET and type: ESC R 3 ESC F (for full duplex) or H (half duplex). This sets up for 300 Baud, and the routine will not work above this because BASIC cannot accept the file fast enough.

You can hit CONTROL-SHIFT CPU RESET at any time and get into BASIC. The other computer will stay connected, and you can get back to it later by hitting CPU RESET again and entering the Baud rate as above.

Once connected, OK, get into BASIC and LOAD the transfer program below. RUN the program, and sit back and watch as the file is transferred (it appears on the screen). When it is finished, save it on disk then get back into terminal communications mode as explained above. Anything that the other computer sends which BASIC does not understand will simply cause a SN (syntax) error. For example, I get an "EOF" from the Text Editor on the IBM machine at the end of the file.

The program will ask you for a command line, which is sent to the other computer to initiate the transfer. I usually get into the Text Editor on the other machine, so the command is something like "T 100" which types out 100 lines of the BASIC file I want to transfer. This part is very dependent on the other machine you are connected to. If it is a hobby computer, you may want to say "OK Fred, Send The File", or something like that. Note that the quotes are required if the command line contains spaces.

There is one slight bug in the routine, which is a property of BASIC on the Compucolor. If there are more than four (4) variable names in a line as it is transferred, the line-feed at the end of the line will be inserted into the program in memory. This is because BASIC takes too long working out the addresses of the variables, and meanwhile, the line-feed arrives. Normally, BASIC ignores line-feeds, but it is preoccupied and doesn't see it slip by.

There are two solutions to this problem: either use FREDI and edit them out (they appear in red, so this is easy); or write a program on the other machine that will wait a while after a line is sent between sending the carriage-return and line-feed. This can be done easily in FORTRAN and PASCAL. Better still, do not send a line-feed (send nulls if necessary). However, this may require an assembly language program on the other machine.

The program illustrates the use of the user input flag, number 31 and the BASIC input flag, number 23. The assembly language code which it stores in memory is as follows:

```
XFER: MOV A,E      ;CHR IS IN E
      ANI 7FH      ;MASK OUT PARITY
      MOV E,A      ;SAVE THE CHR
      LXI H,FLAG   ;GET BASIC INPUT FLAG
      JMP 398CH    ;INDEX INTO I/O JUMP TABLE
FLAG: DB 23
```

It masks out the parity bit on characters received from the RS-232C port, and calls a routine inside FCS. The address of this routine is for Version 6.78 of FCS, and I do not know

the equivalent for Version 8.79, but I suspect it is different. Other "filtering" can be done by XFER, such as removing control characters. (If the other machine is a CCII, you will lose color codes if you chop out all control characters.) Also, if the host (sending) computer sends only zeros for parity bits, then this Assembly Language is not necessary, and the whole routine reduces to three lines -- 65170, 65180, and 65190 -- with the 31 replaced by 23 in line 65190. However, neither of the machines I use are this cooperative.

Lines 65100 to 65140 are the usual method of loading a machine code routine. In line 65160, a jump to XFER is set up at the user input flag jump vector, 33221 (81C5H). Then interrupts are enabled, the Baud rate set and output is directed to the RS-232C port in line 65180. Note the use of 'CHR\$(13);' to output a carriage return, but no line-feed. After the command is sent in line 65190. Printed output is returned to the display, the input from the RS-232C port is directed through the user input vector, and the program exits. BASIC is now in the normal READY mode, and the transfer takes place via interrupts.

The end of BASIC gets moved back each time the program is run, so it is necessary to reinitialize BASIC between successive file transfers. In fact, you can merge two files (even with some line numbers in common -- the second file wins) by transferring them one after the other without reinitializing BASIC.

Also, the transfer routine will be tacked on the end of the transferred file, unless there are duplicate line numbers in the file (65000 and up). It is alright to have duplicate line numbers, because the program's work is done as soon as it has executed, which is before the transfer starts, i.e. the program only loads an Assembly Language interrupt routine, but does not perform the actual transfer.

Probably the hardest part of the whole thing will be working out a command line to initialize the transfer. Of course, you may also have to translate from the dialect of BASIC used on the other machine into Compucolor BASIC.

There are much neater methods of transferring files, but this one is nice just because it is so compact. Any suggestions are welcomed, and it should be pointed out that Compucolor is working on a Communications Sof-Disk which will probably obsolete this routine.

```
65000 REM *** BASIC FILE TRANSFER PROGRAM ***
65010 REM
65020 REM THE PROGRAM SETS UP A LITTLE MACHINE LANGUAGE 65030
REM ROUTINE TO FILTER THE INPUT FROM THE RS-232C PORT,
65040 REM THEN RETURNS TO BASIC. BASIC THINKS THE INPUT FROM
65050 REM THE RS-232C PORT IS BEING TYPED AT THE KEYBOARD, SO
65060 REM A "READY" MESSAGE APPEARS AND THE FILE COMES OUT ON
65070 REM THE SCREEN ALSO.
```



```

65075 REM
65080 REM *** MACHINE LANGUAGE CODE ***
65090 DATA 123,230,127,95,33,0,0,195,140,57,23
65095 REM *** FIND END OF BASIC AND MOVE IT BACK ***
65100 EB = 256* PEEK (32941)+ PEEK (32940)
65110 EB = EB- 11:Z = EB:AD = 32940: GOSUB 65200
65115 RESTORE 65090
65125 REM *** STORE THE MACHINE LANGUAGE ROUTINE ***
65130 FOR I= 1 TO 11:READ X:POKE EB+ I,X:NEXT I
65140 Z = EB+ 11:AD = EB+ 6:GOSUB 65200
65155 REM *** SET UP JUMP VECTOR FOR RS-232C PORT ***
65160 POKE 33221,195:Z = EB+ 1:AD = 33222:GOSUB 65200
65170 CLEAR 100:INPUT "ENTER COMMAND LINE:";CM$
65175 REM *** ENABLE ALL INTERRUPTS AND SETUP RS-232C PORT ***
65180 OUT 8,255: PLOT 14,27,18,3,15,27,13
65185 REM *** OUTPUT THE COMMAND LINE TO THE RS-232C PORT ***
65190 PRINT CM$;CHR$ (13);:POKE 33265,0:POKE 33251,31:END
65195 REM *** SUBROUTINE TO STORE AN ADDRESS IN MEMORY ***
65200 HI = INT (Z/ 256):POKE AD,Z- 256* HI:POKE AD+
1,HI:RETURN

```

=

Here's a Utility Bill Analysis program designed to help you determine just how much energy is costing you. This may be a depressing exercise, but it may also provide the jolt you need to cut down your monthly bill. Who says, "what you don't know can't hurt you."

UTILITY BILL ANALYSIS

This program was excerpted, with the kind permission of the publisher, from **BASIC COMPUTER PROGRAMS FOR THE HOME**, by Charles D. Sternberg (Rochelle Park, N.J.: Hayden Book Company, Inc., 1980).

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Description

The rising cost and dwindling supply of energy indicates the need for careful control and analysis of energy usage. This program was designed to assist with these tasks.

Functions of the Program

The program accepts periodic readings of any utility meter and computes daily use and cost information. Totals and averages for the period are produced after all data items have been processed and printed in a tabular form.

Instructions for Use

Determine the unit cost of the energy use from your statement. Read the meter and enter information to the program, as frequently as possible. Daily readings are best for thorough interpretation of the results.

Data Entry

All data is entered as DATA statements.

Data Format

The first record provided is the cost per unit of the item. the second and succeeding records are of the form:

Date of reading, Meter reading

Major Symbol Table - Utility Bill Analysis

| Name | Description |
|------|------------------------------|
| M | Maximum Number of Data Reads |
| C | Cost Per Unit |
| D | Initial Reading Day |
| S | Initial Reading |
| R | Reading |
| T0 | Units Used |
| T1 | Cost Per Day |
| N1 | Day Count |
| T4 | Total Use |
| T3 | Total Cost |

LIST

```
20 REM    UTILITY ANALYSIS PROGRAM
30 REM    **** DATA INITIALIZATION ****
40 M=1000
50 REM    ****
60 REM    **** PROCESSING AREA ****
70 PRINT
80 PRINT
90 PRINT
100 READ C
110 READ D,S
120 PRINT "INITIAL READING WAS ";S;" ON DAY";D
130 PRINT "COST PER UNIT IS ";C
140 PRINT
150 PRINT "DATE";TAB(28);"USE COST"
160 PRINT "READ";TAB(7);"READ";TAB(16);"USED";TAB(28);
"THIS DAY"
170 PRINT "----";TAB(7);"----";TAB(15);"-----";
TAB(28);"-----"
180 T2=S
190 D2=D
200 FOR I=1 TO M
210 N=1
220 READ D
230 IF D=0 THEN 380
```



```

240 IF D<D2 THEN 260
250 N=D-D2
260 D2=D
270 READ R
280 T0=R-T2
290 T1=T0*C
300 PRINT D;TAB(5);R;TAB(15);T0;TAB(28);T1;
310 IF N=1 THEN 330
320 PRINT " *** (";N;" DAYS )";
330 T2=R
340 T3=T3+T1
350 N1=N1+N
360 PRINT
370 NEXT I
380 REM *****
390 REM **** PROGRAM TERMINATION POINT ****
400 T4=R-S
410 PRINT TAB(15);"-----";TAB(28);"-----"
420 PRINT "TOTALS";TAB(15);T4;TAB(28);T3
430 PRINT
440 PRINT "*****"
450 PRINT "FOR ";N1;" DAYS"
460 PRINT "AVERAGE DAILY USE WAS:";T4/N1
470 PRINT "AVERAGE DAILY COST WAS:";T3/N1
480 PRINT "*****"
490 PRINT
500 PRINT
510 REM
520 REM *****
530 REM **** SAMPLE DATA ENTRY FOLLOWS ****
540 DATA .025
550 DATA 24,1500
560 DATA 25,1590
570 DATA 26,1700
580 DATA 27,1800
590 DATA 28,2200
600 DATA 30,2600
610 DATA 1,3000
620 DATA 2,3100
630 DATA 3,3200
640 DATA 5,3500
650 DATA 0
READY

```

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keeping it simple

**AN INTEL
8080 OP
CODE TABLE**

This table contains all the 8 bit numbers from 0 to 255 in decimal and hexadecimal so the table can also be used as a base conversion chart. The following format is used for the mnemonics:

Compiled by Bill Greene
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Byron, Georgia 31008
(912) 956-3351

One byte instructions are shown in capital letters only. Two and three byte instructions have symbols in angle brackets signifying the additional bytes following the op code. LO is the low order byte and HI is the high order byte of an address or immediate data. DB means one byte of immediate data and DV = device code. Unimplemented codes are signified by '- -'.

| DECIMAL | HEXIDECIMAL | MNEMONIC | | | |
|---------|-------------|--------------|-----|----|---------|
| 0 | 00 | NOP | 71 | 47 | MOV B,A |
| 1 | 01 | LXI B<LOHI> | 72 | 48 | MOV C,B |
| 2 | 02 | STAX B | 73 | 49 | MOV C,C |
| 3 | 03 | INX B | 74 | 4A | MOV C,D |
| 4 | 04 | INR B | 75 | 4B | MOV C,E |
| 5 | 05 | DCR B | 76 | 4C | MOV C,H |
| 6 | 06 | MVI B<DB> | 77 | 4D | MOV C,L |
| 7 | 07 | RLC | 78 | 4E | MOV C,M |
| 8 | 08 | - - | 79 | 4F | MOV C,A |
| 9 | 09 | DAD B | 80 | 50 | MOV D,B |
| 10 | 0A | LDAX B | 81 | 51 | MOV D,C |
| 11 | 0B | DCX B | 82 | 52 | MOV D,D |
| 12 | 0C | INR C | 83 | 53 | MOV D,E |
| 13 | 0D | DCR C | 84 | 54 | MOV D,H |
| 14 | 0E | MVI C<DB> | 85 | 55 | MOV D,L |
| 15 | 0F | RRC | 86 | 56 | MOV D,M |
| 16 | 10 | - - | 87 | 57 | MOV D,A |
| 17 | 11 | LXI D<LOHI> | 88 | 58 | MOV E,B |
| 18 | 12 | STAX D | 89 | 59 | MOV E,C |
| 19 | 13 | INX D | 90 | 5A | MOV E,D |
| 20 | 14 | INR D | 91 | 5B | MOV E,E |
| 21 | 15 | DCR D | 92 | 5C | MOV E,H |
| 22 | 16 | MVI D<DB> | 93 | 5D | MOV E,L |
| 23 | 17 | RAL | 94 | 5E | MOV E,M |
| 24 | 18 | - - | 95 | 5F | MOV E,A |
| 25 | 19 | DAD D | 96 | 60 | MOV H,B |
| 26 | 1A | LDAX D | 97 | 61 | MOV H,C |
| 27 | 1B | DCX D | 98 | 62 | MOV H,D |
| 28 | 1C | INR E | 99 | 63 | MOV H,E |
| 29 | 1D | DCR E | 100 | 64 | MOV H,H |
| 30 | 1E | MVI E<DB> | 101 | 65 | MOV H,L |
| 31 | 1F | RAR | 102 | 66 | MOV H,M |
| 32 | 20 | - - | 103 | 67 | MOV H,A |
| 33 | 21 | LXI H<LOHI> | 104 | 68 | MOV L,B |
| 34 | 22 | SHLD <LOHI> | 105 | 69 | MOV L,C |
| 35 | 23 | INX H | 106 | 6A | MOV L,D |
| 36 | 24 | INR H | 107 | 6B | MOV L,E |
| 37 | 25 | DCR H | 108 | 6C | MOV L,H |
| 38 | 26 | MVI H<DB> | 109 | 6D | MOV L,L |
| 39 | 27 | DAA | 110 | 6E | MOV L,M |
| 40 | 28 | - - | 111 | 6F | MOV L,A |
| 41 | 29 | DAD H | 112 | 70 | MOV M,B |
| 42 | 2A | LHLD <LOHI> | 113 | 71 | MOV M,C |
| 43 | 2B | DCX H | 114 | 72 | MOV M,D |
| 44 | 2C | INR L | 115 | 73 | MOV M,E |
| 45 | 2D | DCR L | 116 | 74 | MOV M,H |
| 46 | 2E | MVI L<DB> | 117 | 75 | MOV M,L |
| 47 | 2F | CMA | 118 | 76 | HLT |
| 48 | 30 | - - | 119 | 77 | MOV M,A |
| 49 | 31 | LXI SP<LOHI> | 120 | 78 | MOV A,B |
| 50 | 32 | STA <LOHI> | 121 | 79 | MOV A,C |
| 51 | 33 | INX SP | 122 | 7A | MOV A,D |
| 52 | 34 | INR M | 123 | 7B | MOV A,E |
| 53 | 35 | DCR M | 124 | 7C | MOV A,H |
| 54 | 36 | MVI M<DB> | 125 | 7D | MOV A,L |
| 55 | 37 | STC | 126 | 7E | MOV A,M |
| 56 | 38 | - - | 127 | 7F | MOV A,A |
| 57 | 39 | DAD SP | 128 | 80 | ADD B |
| 58 | 3A | LDA <LOHI> | 129 | 81 | ADD C |
| 59 | 3B | DCX SP | 130 | 82 | ADD D |
| 60 | 3C | INR A | 131 | 83 | ADD E |
| 61 | 3D | DCR A | 132 | 84 | ADD H |
| 62 | 3E | MVI A<DB> | 133 | 85 | ADD L |
| 63 | 3F | CAC | 134 | 86 | ADD M |
| 64 | 40 | MOV B,B | 135 | 87 | ADD A |
| 65 | 41 | MOV B,C | 136 | 88 | ADC B |
| 66 | 42 | MOV B,D | 137 | 89 | ADC C |
| 67 | 43 | MOV B,E | 138 | 8A | ADC D |
| 68 | 44 | MOV B,H | 139 | 8B | ADC E |
| 69 | 45 | MOV B,L | 140 | 8C | ADC H |
| 70 | 46 | MOV B,M | 141 | 8D | ADC L |

| DECIMAL | HEXIDECIMAL | MNEMONIC | | | |
|---------|-------------|------------|-----|----|-------------|
| 142 | 8E | ADC M | 199 | C7 | RST 0 |
| 143 | 8F | ADC A | 200 | C8 | RZ |
| 144 | 90 | SUB B | 201 | C9 | RET |
| 145 | 91 | SUB C | 202 | CA | JZ <LOHI> |
| 146 | 92 | SUB D | 203 | CB | - - |
| 147 | 93 | SUB E | 204 | CC | CZ <LOHI> |
| 148 | 94 | SUB H | 205 | CD | CALL <LOHI> |
| 149 | 95 | SUB L | 206 | CE | ACI <DB> |
| 150 | 96 | SUB M | 207 | CF | RST 1 |
| 151 | 97 | SUB A | 208 | D0 | RNC |
| 152 | 98 | SBB B | 209 | D1 | POP D |
| 153 | 99 | SBB C | 210 | D2 | JNC <LOHI> |
| 154 | 9A | SBB D | 211 | D3 | OUT <DV> |
| 155 | 9B | SBB E | 212 | D4 | CNC <LOHI> |
| 156 | 9C | SBB H | 213 | D5 | PUSH D |
| 157 | 9D | SBB L | 214 | D6 | SUI <DB> |
| 158 | 9E | SBB M | 215 | D7 | RST 2 |
| 159 | 9F | SBB A | 216 | D8 | RC |
| 160 | A0 | ANA B | 217 | D9 | - - |
| 161 | A1 | ANA C | 218 | DA | JC <LOHI> |
| 162 | A2 | ANA D | 219 | DB | IN <DV> |
| 163 | A3 | ANA E | 220 | DC | CC <LOHI> |
| 164 | A4 | ANA H | 221 | DD | - - |
| 165 | A5 | ANA L | 222 | DE | SBI <DB> |
| 166 | A6 | ANA M | 223 | DF | RST 3 |
| 167 | A7 | ANA A | 224 | E0 | RPO |
| 168 | A8 | XRA B | 225 | E1 | POP H |
| 169 | A9 | XRA C | 226 | E2 | JPO <LOHI> |
| 170 | AA | XRA D | 227 | E3 | XTHL |
| 171 | AB | XRA E | 228 | E4 | CPO <LOHI> |
| 172 | AC | XRA H | 229 | E5 | PUSH H |
| 173 | AD | XRA L | 230 | E6 | ANI <DB> |
| 174 | AE | XRA M | 231 | E7 | RST 4 |
| 175 | AF | XRA A | 232 | E8 | RPE |
| 176 | B0 | ORA B | 233 | E9 | PCHL |
| 177 | B1 | ORA C | 234 | EA | JPE <LOHI> |
| 178 | B2 | ORA D | 235 | EB | XCHG |
| 179 | B3 | ORA E | 236 | EC | CPE <LOHI> |
| 180 | B4 | ORA H | 237 | ED | - - |
| 181 | B5 | ORA L | 238 | EE | XRI <DB> |
| 182 | B6 | ORA M | 239 | EF | RST 5 |
| 183 | B7 | ORA A | 240 | F0 | RP |
| 184 | B8 | CMP B | 241 | F1 | POP PSW |
| 185 | B9 | CMP C | 242 | F2 | JP <LOHI> |
| 186 | BA | CMP D | 243 | F3 | DI |
| 187 | BB | CMP E | 244 | F4 | CP <LOHI> |
| 188 | BC | CMP H | 245 | F5 | PUSH PSW |
| 189 | BD | CMP L | 246 | F6 | ORI <DB> |
| 190 | BE | CMP M | 247 | F7 | RST 6 |
| 191 | BF | CMP A | 248 | F8 | RM |
| 192 | C0 | RNZ | 249 | F9 | SPHL |
| 193 | C1 | POP B | 250 | FA | JM <LOHI> |
| 194 | C2 | JNZ <LOHI> | 251 | FB | EI |
| 195 | C3 | JMP <LOHI> | 252 | FC | CM <LOHI> |
| 196 | C4 | CNZ <LOHI> | 253 | FD | - - |
| 197 | C5 | PUSH B | 254 | FE | CPI <DB> |
| 198 | C6 | ADI <DB> | 255 | FF | RST 7 |

=

advanced applications

General math routines perform operations on register pairs in the same way that the assembly language instructions operate on single registers. These routines have the advantage of making code more readable by simply calling the system routine when it is needed instead of placing the code in-line. Since

**GENERAL
MATH
ROUTINES**

the exact function of the routine is known, you can move on to other areas of interest in a particular program.

Here's a list of general math routines. Note that the contents of the A register are always lost.

| | <u>V6.78</u> | <u>V8.79</u> |
|---|--------------|--------------|
| ADHLA - add contents of A to the contents of HL | 3518H | 194EH |
| ANHD - the AND of DE and HL with results in HL; DE is preserved | 351DH | 1953H |
| NEGH - the two's complement of HL | 3524H | 195AH |
| NOTH - the NOT (one's complement) of HL | 3525H | 195BH |
| ORHD - the OR of DE and HL with results in HL; DE is preserved | 352CH | 1962H |
| XORHD - the XOR (exclusive OR) of DE and HL with results in HL; DE is preserved | 3533H | 1969H |
| SHLHD - shift DE left HL times with zero fill and results in HL; DE is lost, BC is preserved | 353AH | 1970H |
| SHRHD - shift DE right HL times with zero fill and results in HL; DE is lost, BC is preserved | 3544H | 197AH |
| MULHD - multiply DE by HL with results in HL; BC is preserved | 3562H | 1998H |
| DIVHD - divide DE by HL with dividend in HL and remainder in DE; BC is preserved | 3581H | 19B7H |

These routines, along with SUBHD (v6.78-3459, v8.79-188F), can create any algebraic expression, provided that 16 bit arithmetic is adequate for the task. Just as an exercise, and to keep you off the streets, the routines for SHLHD and SHRHD are provided below.

```

SHLHD:  CALL    SCMN
        RZ
SL1:    DAD     H
        DCR     E
        JNZ     SL1
        RET

```

```

SHRHD:  CALL    SCMN
        RZ
SR1:    XRA     A

```



```

MOV    A,H
RAR
MOV    H,A
MOV    A,L
RAR
MOV    L,A
DCR    E
JNZ    SRL
RET

```

```

SCMN:  XCHG
        MVI    A,0F0H
        ANA    E
        ORA    D
        JNZ    ZH
        XRA    E
        RET

```

```

ZH:    XRA    A
        MOV    H,A
        MOV    L,A
        RET

```

=

We have not received any suggestions for books that you, **EDITOR'S NOTE** as users, recommend. If you have any favorites, please jot down the title, author, and publisher and drop me a letter or postcard so that I can obtain a copy and read it. Do it today!!

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user group hotline

Anthony Ruggeri is looking for Compucolor User Groups in **BRIEFS** the Chicago area and for interested Compucolor owners for information exchange.

Anthony Ruggeri
1623 E. Howard
Des Plaines, Illinois 60018

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Steve Mann is looking for other Compucolor users in his area. If you live in the Lancaster/Palmdale area, please get in touch.

Steve C. Mann
1103 H-7 West
Lancaster, California 93534

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**HAM
UPDATE**

The Ham User's Group has been meeting on the air waves for several months now, and are inviting any other hams to join in the dialogue. Short-wave listeners are also invited and can write to any of the members if they would like to hear a particular Compucolor subject discussed.

Bill Shanks writes, "In order to minimize QRM (interference from other stations), we meet on 15 meters for the first half hour to best cover the western hemisphere. Then we go to 20 meters for a half hour to make good contact with the rest of the world. We meet each Tuesday. The frequencies and times are:

21,333 Hz from 2300 UT to 2330 UT (4 to 4:30 pm EST)
14,255 Hz from 2330 UT to 0000 UT (4:30 to 5 pm EST)"

As Bill says, Compucolor brings together world-wide friends. Join them some evening!

Bill Shanks, W2GTX
7 Lake Circle Drive
Vicksburg, Mississippi 39180

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COMPUCOLOR USER GROUPS

HEADQUARTERS

COMPUCOLOR USERS GROUP
c/o Compucolor Corp.
225 Technology Park/Atlanta
Norcross, Georgia 30092

EDUCATION USERS GROUP
c/o Compucolor Corp.
225 Technology Park/Atlanta
Norcross, Georgia 30092

COMPUCOLOR USERS GROUP

ALABAMA

Contact: Eike Mueller
12117 Comanche Trail, S.E.
Huntsville, Alabama 35803
(205) 883-7614

No dues or publication.

COMPUCOLOR USERS GROUP

CALIFORNIA

Contact: Mark Nehamkin, Co-President
c/o Intersell
540 Weddell Drive
Suite 9
Sunnyvale, California 94086
(408) 734-5201

\$10 membership fee, 30-40 members. Membership entitles you to a copy of the library. Each member must submit one program to the library. No publication.

COMPUCOLOR/INTECOLOR USER GROUP

Contact: Stan Pro
S.P. Electronics Systems
5250 Van Nuys Boulevard
Van Nuys, California 91401
(213) 788-8850

Membership fee - \$30 per year. Each member will receive four bulletins (about 30 pages each) packed with technical and programming data. Back issues available. They have a library of 1,000 programs including business, education, games, and utilities.

EL CERRITO USER GROUP

Contact: Fred Pezok/Frasier Hewitt
c/o P.C. Computers
10166 San Pablo Avenue
El Cerrito, California 94530
(415) 527-6657

A small but growing group, they have amassed a sizeable list of software in their user group file including control software for the IDS 225 and BASE₂ printers for \$15 each. After August 1, 1980, membership dues will be \$10 plus the submission of one program. Meetings are held on the 3rd or 4th Tuesday of the month at P.C. Computers.

GOTO GROUP

Contact: Tommy W. Schenck
c/o Tom & Bobbie of Newberrys
1136 Fulton Mall
Fresno, California 93721

No dues or publication.

NORTHERN CALIFORNIA USERS GROUP

Contact: Barry L. Parr
c/o Creative Publications
P.O. Box 10328
Palo Alto, California 94303
(415) 968-3977

SAN DIEGO CCII USER GROUP

Contact: Hal Brehe, President
4671 Mt. Arnet Drive
San Diego, California 92117

Just underway, this group had 18 attendees at their organizational meeting. The group has started a newsletter.

SAN JOSE CCII USER GROUP

Contact: Vicki Oliver
1358 Branham Lane, #4
San Jose, California 95118
(408) 267-5250
The SOURCE: CL0691

Approximately 40 members. Dues are \$10, allowing access to a library with approximately 140 programs and a subscription to **Rainbow Random Access**, the Group's newsletter.

FLORIDA JACKS -- JACKSONVILLE AREA COMPUCOLOR KNOWLEDGE SEEKERS

Contact: Gary Haney
1723 Debbie Lane
Orange Park, Florida 32073
(904) 264-6785

ROBINSON HIGH COMPUTER CLUB

Contact: Mrs. Byman
6311 S. Lois Avenue
Tampa, Florida 33616
(813) 835-1211

No dues or publication.

COMPUCOLOR USERS GROUP

GEORGIA

Contact: Irv Mullins
2194 Briarcliff Road, N.E.
Atlanta, Georgia 30329
(Day): (404) 586-5156
(Night): (404) 634-3919

The group meets on the 1st Wednesday of every month.
There is a \$5.00 annual membership fee. No publication.
Approximately 75 members.

COMPUCOLOR USERS GROUP

MASSACHUSETTS

Contact: Richard Manazir
13 Grandview Street
Southwick, Massachusetts 01077
(Day): (203) 688-1911 x4716
(Night): (413) 569-6621

COMPUCOLOR USERS GROUP

NEW JERSEY

Contact: Peter J. Miller
125 Buena Vista Drive
Ringwood, N.J. 07456
(Night): (201) 839-7251

COMPUCOLOR USERS' GROUP OF ROCHESTER, NEW YORK

NEW YORK

Contact: Ben Barlow
161 Brookside Drive
Rochester, N.Y. 14618
(716) 385-2969

Membership fee: \$10, entitles you to subscription to
monthly publication, **Data Chip**, and user library.

COMPUCOLOR USERS' GROUP OF ROCKLAND COUNTY

Contact: Ronnie Schnell
17 Eckerson Lane
Spring Valley, N.Y. 10977
(Night): (914) 352-8069

Membership fee: \$6.00, entitles you to publication,
Compusource, and discounts on Compucolor materials.

COMPUCOLOR II USERS' GROUP

OREGON

Contact: Bruce Vanderzanden
2006 "C" Street
Forest Grove, Oregon 97116
(503) 357-2772

Just formed, no dues.

PENNSYLVANIA PHILADELPHIA CCII USERS GROUP

Contact: Howard Rosen
P.O.Box 434
Huntingdon Valley, Pa. 19006
(215) 464-7145

Just formed. Howard is an engineer and a Compucolor dealer -- a good source to tap.

VIRGINIA COMPUCOLOR USERS GROUP

Contact: Rick Vick
702 W. Holly Avenue
Sterling, Virginia 22170
(Day): (703) 827-3894
(Night): (703) 430-3843

INTERNATIONAL HAM RADIO USERS GROUP

Contact: Bill Shanks, W2GTX
7 Lake Circle Drive
Vicksburg, Mississippi 39180

AUSTRALIA COMPUCOLOR USER GROUP/SYDNEY AREA

Contact: Andrew McIntosh
91 Regent Street
Chippendale, N.S.W., 2008
Australia

COMPUCOLOR USER GROUP/MELBOURNE AREA

Contact: Neil Brandie
212 High Street
Windsor, Victoria, 3181
Australia

CANADA CANADIAN USERS GROUP

Contact: Glen Davis, President
Bsmt-59 Kendal Avenue
Toronto, Ontario
Canada, M5R 1L8

The Canadian Users Group meets once every 2 months on the last Tuesday of the month at different locations near metropolitan Toronto. Fees are \$15.00 per year which includes a newsletter. There are currently about 55 members.

COMPUCOLOR USERS GROUP

Contact: Mark Herzog
House of Computers
368 Eglinton Avenue, West
Toronto, Ontario
Canada M5N 1A2
(416) 482-4336

c/o Alberto Nogueras
 Evertsenstraat 20
 5224 HP Den Bosch
 The Netherlands

input

Howard Rosen writes:

"My hat's off to Dave Suits. He keeps adding to those hidden capabilities of Compucolor. I entered his "Hatch Character" program, and it ran great. After a little examination, I noticed that color combinations -- FG/BG -- were repeated, viz.; 17,18 & 18,17, for one example. I then proceeded, with FREDI's help, of course, to change the program to..."

```
10 PLOT 27,24
20 PLOT 30,16,29,16
30 PLOT 15,12
35 PLOT 14,3,11,0:PRINT "COLOR COMBINATIONS CREATED BY
COMPUCOLOR"
38 PLOT 15
40 FOR X= 6TO 58STEP 13
50 PLOT 3,X,4:PLOT 17:PRINT "BG";:PLOT 22:PRINT "FG"
60 NEXT :PRINT "-----"
-----"
70 BG= 16:FG= 16
80 FOR X= 0TO 52STEP 13
90 FOR Y= 7TO 27STEP 3
100 FG= FG+ 1
110 IF FG= 24THEN FG= BG+ 1:BG= BG+ 1
120 IF BG= 24THEN X= 48:Y= 31:GOTO 170
130 PLOT 30,BG,29,FG,3,X,Y
140 PLOT 96,96,96,96,25
150 PLOT 6,1:PRINT BG;
160 PLOT 6,6:PRINT FG
170 NEXT Y,X
180 PLOT 6,2,3,48,31
190 INPUT "WAITING...";A$
200 PLOT 27,11
```

Howard Rosen
 P.O. Box 434
 Huntingdon Valley, Pa. 19006
 (215) 464-7145

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From Bernie Muldowney:

Although we have now commenced an Australian **COLORCUE**, I wish to keep up with your news as it happens. I continue to be amazed at the riches of the CCII which develop in each issue and extend beyond what is in the programming manual -- keep up the good work.

I recently purchased a 'SHOOT' disk (your real-time PRG. type programs are so good they shame the others who usually attempt real-time in BASIC which is very unreal) and was perplexed to find that the '15 PUZZLE' game on occasions produced a combination which was insoluble. I therefore looked through the listing to find the test routine for discarding the impossible ones and found there one which was identical line for line with one I discovered in Don Spencer's "Game Playing With BASIC". I was at a loss to see why the odd bad combination turned up...after all the book must be right.... Further experimentation (looking at values for T mainly), revealed that although the flow chart in the book followed the stated algorithm, the BASIC listing did not in that it terminated the test for lesser numbers after only finding the first sequential number less than the number under test in the array. It seems that the author of '15 PUZZLE' took this listing uncritically and fell foul of it. The error is eliminated by altering line 1940 to increment T following the THEN statement rather than GOTO 1970; then deleting lines 1970 and 1980.

Further minor bugs were:

- (a) the value of PC 'number of moves' is not re-initialized after each play -- this is fixed by adding (:PC=0) to the end of line 210;
- (b) optionally, but in my opinion preferably, the number of moves should be printed immediately when the array is acknowledged as in order, rather than after you decide whether to continue or not. This involved converting line 650 to a REM statement only, replacing line 2750 with PRINT:PRINT"IN"PC"MOVES", converting the cursor address in line 2760 to 3,1,11 from 3,1,8, and deleting line 2780. All of the above could be tidied slightly with a RENUM operation but I judged the above edit to be OK.

Please pass on the above to all those puzzlers out there who are cursing the game for occasionally being stubborn. Let me state that I think the software you produce is first class, head and shoulders above the rest, and that the above bug is really only slight and provided me with a lot of fun finding it.

=

SAVE THAT DISK!

By James I. Johnson
reprinted from the
January 1980 issue
of **DATA CHIP**, the
newsletter of the
Rochester Users'
Group.

If you are loading your favorite program or one you have been working on for days (weeks if you are like me) and you do not have a backup copy and you see:

EDCS CD00:00 000E

do not panic yet. Try the following procedure while the disk with the error is still in the drive:

Press BL/A7 OFF ; to set small characters
 Type ESC D ; to enter FCS
 FCS> ; will appear
 Press ERASE PAGE
 FCS> ; will be at the top of the screen
 FCS>REA E 6000 80 ; will try to read the bad block
 EDCS CD00:00 000E ; if you see this keep reading the bad block

.
 .
 .

FCS>REA E 6000 80 ; if you read without any error then
 FCS>WRI E 6000 80 ; write the block back to the disk

The bad block will be read to the top of the screen. If you try reading 5 times and still get an ERROR each time, then try removing and reinserting the disk. If you read another 5 times with an ERROR each time then try reading the disk another time. If you get any ERROR except EDCS then stop, this disk should be reformatted after all retrievable information is removed.

CAUTION: Do not allow the FCS> to reach the bottom of the screen, it may enter the top and be written back to the disk then that disk block will have incorrect information.

=

Mike Ungerman writes:

"With all the SAVING and LOADING I do to move BASIC programs from disk to disk, I run into a real stumbling block in moving PRG or LDA files from one disk to another.

Mike Ungerman
 Mike's Programming Service
 Route 2 Box 623
 Sugarloaf Shores,
 Florida 33042

I have hit on a trial and error method that seems to work most of the time -- but there must be an easier way.

I look in the Directory of the disk and note the size of the file I want to transfer. Using FCS, I LOAD the PRG or LDA file, then I put the new disk in the drive and calculate what I think is the new memory spec and SAVE thusly:

FCS> SAVE (filename) LADR-(calculated value) LADR

where calculated value = ((Size- 1)* 80H)+ LBC -1. Of course, it helps to have a TI Programmer for the HEX multiplication -- and this doesn't work by exactly 6 bytes when the LBC= 80 (don't ask me why)?!

I'm sure I'm not the only one who would like to have a COPY command that works with 1 disk drive -- perhaps there's some kind heart in the readership who has the exact routine required."

=

"Mr. Taylor describes a method to generate a "break" on the RS-232C line. I find that a much easier method is to issue the command OUT 4,10 to start the "break" and OUT 4,8 to end it."

Howard Flank
 Flank Associates
 2809 Atlanta Drive
 Wheaton, Maryland 20906
 (301) 933-7713

From Bill Greene:

"NOTE: The IBM Bit-Banging Driver in the May issue is not a complete program. It is the output routine taken from my IBM Driver program to demonstrate 'bit-banging', the technique of sending one bit at a time to the RS-232C port under software control. The technique is useful for sending non-ASCII code such as IBM and Baudot at nonstandard baud rates. The same technique can also be used to send ASCII at standard baud rates for special applications.

The complete program, with overlay tables for IBM BCD, EBCD, and Correspondence Codes, is available directly from me on diskette for \$25.00. Several other programs are on the diskette with instructions for patching the IBM Driver to BASIC and Assembly language programs. I have put together three other diskettes that I am offering for sale:

UTILITIES (\$25.00), featuring Super Monitor - a monitor/debugger/calculator (runs in 2K), with Symbol Table Sorter and an easy-to-use program for check and cash expenditure records. GAMES (\$20.00), featuring Milestones, a French card game of travel with hazards, remedies, safeties and coup fourre'. All diskettes require 16K."

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Bill Boom, of Davenport, Iowa, has written requesting information on interfacing the Compucolor to the 33AR (repeater) -- the kind used by the phone company. An optically coupled RS-232C to TTY interface is available for \$65 from Solid State Instruments, Inc., 9750 Fred Drive, Denver Colorado 80221, (303) 452-2604.

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attn/break

In "Micro Data Base Systems Releases Software for the Compucolor" in the Product Showcase section of May's issue, a number of software packages, available from Jerry Kidd, were described with the statement that information could be obtained by writing to Micro Data Base Systems for a catalog. Jerry Kidd is not affiliated with Micro Data Base Systems at all but can be reached by writing to Box 242, Cohutta, Georgia 30710.

Micro Data Base Systems develops data base management systems for Z-80 and 8080 micro systems such as the Compucolor. They can be reached by writing P.O. Box 248, Lafayette, Indiana 47902 or by calling (317) 742-7388. Sorry for the confusion.

HOW TO SUBSCRIBE AND ORDER BACK ISSUES

New owners are entitled to a six month's free subscription to **COLORCUE** as soon as their warranty card has been returned. Following the first six month's free subscription, the subscription rate is \$12 per year in the U.S., Canada, and Mexico and \$24 throughout the rest of the world.

Each quarter, back issues are combined into one issue covering that period. Quarterly issues may be ordered for \$5 each. Once the quarterly issue is ready, individual issues will not be sold separately. During the current quarter, individual issues are available for \$2 each.

Below is a list of all back issues of **COLORCUE**. To order, fill out the attached order blank, enclose your check or money order (no cash, please), and mail your order to:

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225 Technology Park/Atlanta
Norcross, Georgia 30092

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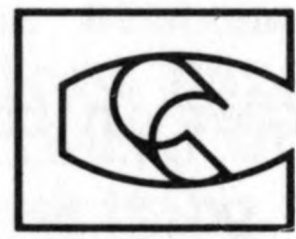
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